

ASSIGNMENT 3

Textbook Assignment: "Celestial Observations and Sight Reduction Methods," chapter 9, pages 9-1 through 9-24.

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| <p>3-1. Which of the following celestial bodies is/are NOT used to determine gyro error?</p> <ol style="list-style-type: none"> 1. Sun only 2. Stars 3. Moon only 4. Polaris and Sun <p>3-2. A minimum of how many azimuths of the Sun are shot when figuring gyrocompass error?</p> <ol style="list-style-type: none"> 1. 5 2. 2 3. 3 4. 4 <p>3-3. Why take multiple observations when determining gyrocompass error by azimuth of the Sun?</p> <ol style="list-style-type: none"> 1. To make sure the gyro is working properly 2. To use the lowest gyro error obtained 3. To use the highest gyro error obtained 4. The average of all azimuth observations obtained gives a more accurate gyro error <p>3-4. What publication is used to figure the first half of an azimuth of the Sun?</p> <ol style="list-style-type: none"> 1. Nautical Almanac 2. Air Almanac 3. H.O. Pub 229 4. H.O. Pub 249 | <p>3-6. What is the Total GHA?</p> <ol style="list-style-type: none"> 1. $68^{\circ} 17.4'$ 2. $71^{\circ} 16.8'$ 3. $74^{\circ} 15.8'$ 4. $76^{\circ} 58.8'$ <p>3-7. What is the LHA?</p> <ol style="list-style-type: none"> 1. $51^{\circ} 57.8'$ 2. $52^{\circ} 16.8'$ 3. $96^{\circ} 47.3'$ 4. $98^{\circ} 08.1'$ <p>3-8. What is the True Dec?</p> <ol style="list-style-type: none"> 1. S $19^{\circ} 21.9'$ 2. S $19^{\circ} 22.5'$ 3. S $19^{\circ} 21.9'$ 4. S $19^{\circ} 23.1'$ <p>3-9. What is the Tab Z?</p> <ol style="list-style-type: none"> 1. 128.7° 2. 129.0° 3. 129.4° 4. 129.9° <p>3-10. What is the (a) Dec Inc and (b) Z diff?</p> <ol style="list-style-type: none"> 1. (a) -38 (b) +.7 2. (a) .35 (b) -.7 3. (a) .38 (b) +.9 4. (a) .32 (b) -.8 <p>3-11. What is the Dec Corr?</p> <ol style="list-style-type: none"> 1. +.27 2. -.27 3. +.25 4. -.26 |
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YOUR SHIP IS STEAMING IN THE NORTH ATLANTIC, AND YOU FIGURE GYROCOMPASS ERROR BY AZIMUTH OF THE SUN. THE DATE IS 18 NOVEMBER 1984, THE DR LATITUDE IS $34^{\circ} 58'N$, AND LONGITUDE IS $22^{\circ} 18'W$. THE ZONE TIME IS 14h 42m 19s, AND YOU OBSERVE THE SUN'S AZIMUTH AT 227.8° .

IN ANSWERING QUESTIONS 3-5 THROUGH 3-19, REFER TO FIGURES 9-1, 9-2, 9-3, AND 9-4 IN YOUR TEXT.

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| <p>3-5. What is the GHA?</p> <ol style="list-style-type: none"> 1. $48^{\circ} 42.2'$ 2. $63^{\circ} 41.0'$ 3. $273^{\circ} 42.2'$ 4. $288^{\circ} 42.8'$ | <p>3-12. What are the (a) Lat Inc and (b) Z diff?</p> <ol style="list-style-type: none"> 1. (a) .98 (b) +.2 2. (a) .97 (b) +.2 3. (a) .96 (b) -.2 4. (a) .95 (b) -.2 <p>3-13. What is the Lat Corr?</p> <ol style="list-style-type: none"> 1. +1.5 2. -1.5 3. +1.9 4. -1.9 |
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- 3-14. What is the (a) LHA Inc and (b) Z diff?
1. (a) .99 (b) -.5
 2. (a) .97 (b) +.7
 3. (a) .95 (b) +.8
 4. (a) .96 (b) -.8
- 3-15. What is the LHA Corr?
1. +.77
 2. -.77
 3. +.82
 4. -.82
- 3-16. What is the Total Corr?
1. +.1
 2. 0
 3. -.1
 4. -.3
- 3-17. What is the Exact Z?
1. 129.5°
 2. 129.4°
 3. 129.3°
 4. 129.1°
- 3-18. What is the Exact ZN?
1. 050.9°
 2. 221.7°
 3. 230.7°
 4. 230.9°
- 3-19. What is the Gyro Error?
1. 1.7°W
 2. 2.1°E
 3. 2.7°W
 4. 3.1°E
- 3-20. Polaris is always located within how many degrees of true north?
1. 1°
 2. 2°
 3. 3°
 4. 4°
- 3-21. At what maximum latitude can an Azimuth by Polaris be taken?
1. 60°
 2. 65°
 3. 70°
 4. 75°
- 3-22. What area is best for observing an Azimuth by Polaris?
1. North latitudes
 2. Lower northern latitudes
 3. Higher northern latitudes
 4. The Equator
- 3-23. How is Amplitude of the Sun defined?
1. The arc of the horizon between the prime vertical circle and the observed body
 2. The arc of the horizon between the prime horizontal circle and the observed body
 3. The arc of the horizon between the celestial horizon and the observed body
 4. the arc of the celestial horizon between the vertical circle and the observed body
- 3-24. The prime vertical circle may be true or magnetic depending on which east or west points are involved?
1. True
 2. False
- 3-25. How does the celestial horizon differ from the visible horizon?
1. They are perpendicular to each other
 2. The celestial horizon runs through the center of the Earth
 3. The celestial horizon and the Equator coincide
 4. The celestial horizon is perpendicular to the Earth's axis
- 3-26. When the center of the Sun is on the celestial horizon, what percentage of the Sun's diameter is above the visible horizon?
1. 25
 2. 33
 3. 67
 4. 75
- 3-27. When planets and stars are on the celestial horizon, how much of them is above the visible horizon?
1. Little less than one Sun diameter
 2. Little more than one Sun diameter
 3. Little more than two Sun diameters
 4. Little less than two Sun diameters
- 3-28. The amplitude of the body is setting and the declination is north. What is the (a) prefix and (b) suffix?
1. (a) East (b) south
 2. (a) West (b) north
 3. (a) North (b) east
 4. (a) South (b) west

3-29. What information must be known to figure an amplitude of the Sun?

1. DR latitude, DR longitude, declination, and true bearing to the Sun
2. LMT, DR latitude declination, and true bearing to the Sun
3. LMT, DR latitude DR longitude, declination, and true bearing to the Sun
4. LMT, DR latitude, declination, and true bearing to the Sun

YOUR SHIP IS STEAMING IN THE NORTH ATLANTIC, AND YOU FIGURE AN AMPLITUDE. YOUR DR LATITUDE IS $38^{\circ} 08.1'N$. THE DECLINATION IS $S 21^{\circ} 00.0'$. THE SUN'S POSITION IS SETTING AND THE SUN'S TRUE BEARING $245.2^{\circ}T$.

IN ANSWERING QUESTIONS 3-30 THROUGH 3-34, REFER TO FIGURE 9-7 IN YOUR TEXT.

3-30. How is the amplitude labeled?

1. E $27.1^{\circ} N$
2. W $27.1^{\circ} S$
3. E $27.7^{\circ} S$
4. W $27.7^{\circ} N$

3-31. What is the azimuth?

1. 062.9°
2. 117.1°
3. 242.9°
4. 297.7°

3-32. What is the gyro error?

1. $2.3^{\circ}W$
2. $2.5^{\circ}W$
3. $2.7^{\circ}E$
4. $3.1^{\circ}E$

3-33. The ship's latitude is $37^{\circ} 00.8'N$ and the declination is $S 20.0^{\circ}$. What is the azimuth?

1. 25.0°
2. 25.3°
3. 25.4°
4. 25.7°

3-34. The ship's latitude is $39^{\circ} 35'0 N$ and the declination is $S 22^{\circ} 48'$. What is the azimuth?

1. 29.4°
2. 29.5°
3. 30.2°
4. 30.4°

3-35. Your ship is on the Equator, and the declination is $N 18^{\circ} 51'$. What is the azimuth?

1. 18.5°
2. 18.8°
3. 18.9°
4. 19.0°

3-36. Which of the following rules for figuring an amplitude is expressed correctly?

1. Setting Sun with north declination, add amplitude to 090°
2. Setting Sun with south declination, subtract amplitude from 090°
3. Setting Sun with north declination, add amplitude to 270°
4. Setting Sun with south declination, subtract amplitude from 270°

3-37. What is the correct formula for figuring amplitude in south latitude, with north declination, and the Sun is rising?

1. $090^{\circ} - \text{amplitude}$
2. $090^{\circ} + \text{amplitude}$
3. $279^{\circ} - \text{amplitude}$
4. $270^{\circ} + \text{amplitude}$

3-38. When using Bowditch (tables), volume II, in addition to table 27, when is table 28 used to figure amplitude?

1. When the ship is in southern latitudes
2. When the ship is on the Equator
3. If the body is observed when its center is on the celestial fix? horizon
4. If the body is observed when its center is on the visible horizon

3-39. What is the most accurate method of obtaining a celestial fix?

1. Take many sightings in a short period of time
2. Take a few sightings in a short period of time
3. Take as many sightings as you can in 15 minutes
4. Take 6 or more sightings in 15-30 minutes

- 3-40. What type of fix is obtained by one LOP of a heavenly body?
1. AP
 2. EP
 3. DR
 4. Celestial
- 3-41. How is the star's altitude from the assumed position referred?
1. Ha
 2. Ho
 3. Hc
 4. Hz
- 3-42. Which of the following is the sextant altitude of a star?
1. Ha
 2. Ho
 3. Hc
 4. Hs
- 3-43. What is obtained when sextant altitude is corrected?
1. Ho
 2. Ha
 3. Hc
 4. Hs
- 3-44. When plotting a star's LOP, the abbreviation HoMoTo means the altitude intercept should be measured from the EP toward the star.
1. True
 2. False
- 3-45. When you are observing the Sun, what is the next step to carry out after you have trained the line of sight on the point of the horizon just below the Sun?
1. Raise the sextant until the line of sight touches the lower limb of the Sun
 2. Swing the arc about the line of sight
 3. Move the index arm until the Sun appears in the mirror
 4. Move the micrometer drum to bring the direct and the reflected horizons in line

IN ANSWERING QUESTIONS 3-46 THROUGH 3-49, SELECT FROM COLUMN B THE DESCRIPTION THAT MATCHES THE CORRECTION IN COLUMN A. RESPONSES WILL ONLY BE USED ONCE.

<u>A. CORRECTION</u>	<u>B. DESCRIPTION</u>
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| 3-46. Refraction | 1. Difference between the celestial and visible horizons |
| 3-47. Dip | 2. Deviation of rays of light from a straight line Earth's atmosphere |
| 3-48. Parallax | 3. Proximity of bodies of the solar system to the Earth, resulting in a difference in altitudes measured from the surface and the center of the Earth |
| 3-49. Semidiameter | 4. Results from the nearness of bodies of the solar system. Makes it necessary to consider the observed bodies as appreciable size instead of points of light |

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- 3-50. When does maximum refraction occur?
1. When a body is on the horizon amounting to between 24 and 29 minutes of arc
 2. When a body is on the horizon amounting to between 34 and 39 minutes of arc
 3. When a body is on the horizon amounting to between 18 and 27 minutes of arc
 4. When a body is on the horizon amounting to between 35 and 45 minutes of arc
- 3-51. Refraction varies with atmospheric conditions. At what point should observations be regarded as suspicious?
1. Below 5°
 2. Below 10°
 3. Above 15°
 4. At 0°

- 3-52. Dip corrections are always subtracted.
1. True
 2. False
- 3-53. Failure to correct for dip at a height of 10 feet will result in how much error?
1. 1 mi
 2. 3 mi
 3. 5 mi
 4. 10 mi
- 3-54. How is parallax always applied?
1. Multiplied
 2. Divided
 3. Added
 4. Subtracted
- 3-55. Which of the following describes parallax in relation to celestial bodies?
1. Parallax of the Sun is small
 2. Parallax of the planets is smaller
 3. Parallax of stars is tiny
 4. All of the above
- 3-56. If the upper limb of a celestial body is observed, how is the semidiameter applied?
1. Added
 2. Multiplied
 3. Divided
 4. Subtracted
- 3-57. What is the usual semidiameter correction for the Sun and Moon?
1. 10 min
 2. 15 min
 3. 16 min
 4. 20 min
- 3-58. The Nautical Almanac contains some tables that combine refraction, parallax, and semidiameter.
1. True
 2. False
- 3-59. Which strip form is used to reduce star sights?
1. OPNAV 3530/30 H.O. 229 Nautical Almanac
 2. OPNAV 3530/30 H.O. 249 Nautical Almanac
 3. OPNAV 3030/35 H.O. 229 Nautical Almanac
 4. OPNAV 3530/35 H.O. 229, H.O. 249
- 3-60. The dip is -2.3 and the IC correction is +2.5. What is the total sextant correction?
1. +4.8
 2. -4.8
 3. +0.2
 4. -0.2
- 3-61. The HA is $26^{\circ} 47.8'$, and the altitude correction is $23.9'$. What is the Ho?
1. $26^{\circ} 11.7'$
 2. $26^{\circ} 23.9'$
 3. $26^{\circ} 71.7'$
 4. $27^{\circ} 11.7'$